

**Studies on Neotropical Veliidae (Hemiptera) VIII:
New Species and Notes¹**

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Abstract.—The following new taxa are described: *Stridulivelia (Aenictovelina) speciosa*, n. sp. from Mesoamerica, *Rhagovelina rivulosa*, n. sp. from Brazil and *Paravelina truxali*, n. sp. from Brazil. *Rhagovelina perfidiosa* Bacon is shown to be a junior synonym of *R. traili* (Buchanan-White) (New Synonymy). The range of *Veloidea reposita* Drake and Harris is extended to include Honduras and Mexico.

This paper is the eighth of a series dealing with the Veliidae of the Western Hemisphere, and is based mainly on material in the Polhemus collection. Type dispositions are given under each species. Institutional and private collection abbreviations are as follows: Natural History Museum of Los Angeles County, LACM; British Museum (Natural History), BMNH; H. H. Weber Collection, HHW; J. T. Polhemus Collection, JTP. We are indebted to Dr. Charles L. Hogue (LACM), and Dr. H. H. Weber, Kiel, and Dr. William R. Dolling (BMNH) for the opportunity to study specimens under their care. Unless otherwise stated, for all measurements 60 units = 1 mm.

***Stridulivelia (Aenictovelina) speciosa*, NEW SPECIES**

Macropterous male.—Elongate, broadest across humeral angles of pronotum; coloration brown with scattered silvery patches; length, $\bar{x} = 4.99$ mm, $s = 0.13$, $n = 10$; maximum width, $\bar{x} = 1.61$ mm, $s = 0.07$, $n = 10$.

Head brown, darker medially on frons; two subtriangular pruinose patches (1 + 1) adjoining anterior margins of eyes; frons set with fine black setae, interspersed with very fine gold setae, median furrow present; width of eye/interocular space, 16/24. Antennae brown, segment I stoutest, curved; segments II and III slender, cylindrical; segment IV subfusiform; all segments covered with fine gold setae intermixed with longer black bristle-like setae; proportions of antennal segments I–IV as follows: 54; 41; 31; 28.

Pronotum brown, anterior lobe darker; humeral angles prominent; anterior and posterior lobes separated by a row of coarse pits, a second row of coarse pits setting off collar; anterior lobe set with fine gold setae, two (1 + 1) large subrectangular silvery hair patches present near anterior angles; posterior lobe subcarinate medially, surface to either side set with numerous pits; surface between pits covered with minute yellow granulations and short gold setae; pronotal margins smooth, set with short black setae; a tuft of longer black setae present medially

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on posterior margin; pleural region infuscated, set with coarse, irregular pits fringed by pale setae; pronotum length 48, width across humeral angles 46.

Abdomen brown, surface thickly covered with fine gold setae intermixed with longer dark brown setae; connexival spines short, barely produced. Hemelytra long, dark brown, reaching to tip of abdomen; two (1 + 1) subtriangular patches of silvery hairs present basally near costal margins; a dusky yellow spot present centrally caudad; basal half of hemelytra with fine gold setae, intermixed with longer black setae along costal margins; veins light brown, margined with darker brown, enclosed cells also light brown.

Ventral surface dark brown, abdomen brownish, rostrum brown, glabrous, with dark stripe medially, tip black; meso- and metasternites set with long, fine golden setae; abdomen with fine gold setae. Legs yellow brown, coxae and trochanters pallid, tips of trochanters and femora infuscated, posterior femora broadly annulate with brown medially; all segments covered with short, fine gold setae, intermixed with longer black setae; fore and middle femora and tibiae with evenly spaced long black setae ventrally, 10–20 per segment; posterior femora with longitudinal row of black pegs, consisting of about 20 small pegs before middle, one large peg slightly beyond middle, and about 10 pegs of decreasing size toward apex; posterior tibia each with a longitudinal array of about 30 black pegs; legs with following proportions:

	<u>Femora</u>	<u>Tibia</u>	<u>Tarsal I</u>	<u>Tarsal II</u>	<u>Tarsal III</u>
Anterior	68	68	2	3	19
Middle	110	116	5	29	34
Posterior	99	108	5	20	26

Parameres symmetrical, ovate, acuminate apically (see Fig. 1).

Macropterous female.—All features except genitalia very similar to macropterous male including size and shape of posterior femur; the latter has fewer basal black pegs; length, $\bar{x} = 5.03$ mm, $s = 0.09$, $n = 10$; maximum width, $\bar{x} = 1.65$ mm, $s = 0.04$, $n = 10$.

Apterous male.—Coloration and other features as in macropterous male; humeral angles less produced, posterior lobe of pronotum evenly rounded; abdomen brownish black, connexiva lighter brown, tergites 5–7 shining; surface of abdomen thickly clothed with fine gold setae, two (1 + 1) small silvery hair patches present at basal abdominal angles; posterior femora with two short rows of black pegs, pegs becoming stouter basally; length, $\bar{x} = 4.88$ mm, $s = 0.06$, $n = 5$; maximum width, $\bar{x} = 1.30$ mm, $s = 0.03$, $n = 5$.

Apterous female.—Very similar to apterous male except connexiva reflexed at 45° angle; $\bar{x} = 5.09$ mm, $s = 0.06$, $n = 8$; maximum width, $\bar{x} = 1.47$ mm, $s = 0.09$, $n = 8$.

Material examined.—Holotype alate ♂ and allotype alate ♀: HONDURAS, 17 mi E of Jicaro Galan, CL1311, I-9-70, J. T. Polhemus (JTP). Paratypes as follows: HONDURAS, 13 ♂, 4 ♀ alate, 3 ♀ apterous, same data as types (JTP); 2 ♂, 1 ♀ alate, 4 ♂, 3 ♀ apterous, 16 mi S of San Lorenzo, CL1310, I-9-70, J. T. Polhemus (JTP); 14 ♂, 12 ♀ alate, 1 ♂, 1 ♀ apterous, 10 mi S of Choluteca, CL1260, XII-22-69, J. T. Polhemus (JTP). COSTA RICA, 12 ♂, 13 ♀ alate, 1 ♀ apterous, N of Esparta, CL1264, XII-24-69, J. T. Polhemus (JTP).

Discussion.—On the basis of external morphology *Stridulivelia* (*Aenictovelia*)

speciosa, n. sp. is very closely allied to *S. (A.) epeixis* Drake and Menke. The abdomen is somewhat dorso-ventrally deeper in *speciosa* than *epeixis* resulting in a posteriorly more truncate abdominal ventrite VII in *speciosa* but these are slight differences helpful only if both species are available for comparison. The major difference between the species is the shape of the male paramere (Fig. 1a, b); also the two species are geographically allopatric, *epeixis* known only from western Mexico and *speciosa* known only from Honduras and Costa Rica.

The name *speciosa* means beautiful and refers to the pretty appearance of this water strider.

Rhagovelia rivulosa, NEW SPECIES

Apterous male.—Small robust, coloration brownish black; length, $\bar{x} = 2.78$ mm, $s = 0.07$, $n = 10$; maximum width, $\bar{x} = 1.21$ mm, $s = 0.03$, $n = 10$.

Head brownish black, eyes dark red; frons and vertex with faint medial furrow, surface set with fine recumbent gold setae intermixed with longer upright black setae; two small black depressions present centrally on vertex; eye width/interocular space, 20/28. Antennae black, segment I pallid basally; segment I stoutest, curved, set with about seven stout bristly black setae and covered with fine recumbent gold setae; segment II cylindrical, covered with fine gold setae intermixed with longer black setae, a pair of stout black bristle-like hairs present near middle; segments III and IV with fine gold setae; proportions of antennal segments I–IV as follows: 43; 24; 22; 24.

Pronotum broad, convex, brownish black, surface minutely pitted and covered with fine recumbent gold setae; width/length, 72/55; anterior and posterior lobes separated by an impressed fold; anterior lobe with transversely ovate yellow spot medially; posterior lobe with hind margin rounded; pleural region set with long black setae.

Abdomen brownish black, tapering strongly and evenly; connexiva reflexed at about 45°; abdominal dorsum covered with fine recumbent gold setae.

Venter brownish black, margins of coxal cavities light brown; rostrum chestnut brown, glabrous; metasternum with two (1 + 1) rows of long gold setae running from middle anterior margin to bases of middle coxae; mesosternum with long gold setae bordering coxal cavities; thorax and abdomen sparsely clothed with fine gold setae. Legs black, coxae, fore and posterior trochanters dull yellow; femora covered with fine gold setae, a double row of evenly spaced long black setae present ventrally, scattered stout black setae also present on dorsal surface; posterior femora armed with a row of about eight stout spines ventrally, spines decreasing in size toward apex; tibiae and tarsi clothed with fine recumbent gold setae, intermixed with longer upright black hairs; fore tibia with a row of very fine upright setae on ventral face; proportions of legs as follows:

	<u>Femora</u>	<u>Tibia</u>	<u>Tarsal II</u>	<u>Tarsal III</u>
Anterior	48	55	14	—
Middle	92	65	46	40
Posterior	68	77	5	12

Parameres symmetrical, broad, ovate, shape as in Figure 3.

Apterous female.—Larger and darker in coloration, otherwise similar to male;

length, $\bar{x} = 3.14$ mm, $s = 0.08$, $n = 10$; maximum width, $\bar{x} = 1.27$ mm, $s = 0.03$, $n = 10$.

Macropterous male.—Generally similar to apterous form in structure and color; humeral angles of pronotum more acute; pronotum width/length, 77/67; posterior pronotal apex sharply pointed; wings long, reaching past tip of abdomen, dull brown with fine gold setae along costal margins; length 3.30 mm; maximum width 1.32 mm.

Macropterous female.—Similar to male in structure and coloration, slightly larger; length 3.85 mm; maximum width 1.42 mm.

Material examined.—Holotype apterous ♂ and allotype ♀: BRAZIL, Santa Catarina, Nova Teutonia, IV-75, F. Plaumann (JTP). Paratypes as follows, all from Brazil, Nova Teutonia, collected by F. Plaumann: 232 apterous specimens of both sexes, 1 ♂, 2 ♀ alate, same data as types (JTP); 2 ♂, apterous, XII-1-56, (JTP); 1 ♀ apterous, X-4-56 (JTP); 21 ♂, 22 ♀, apterous, no date (HHW & JTP); 9 ♂, 12 ♀, apterous, IV-75 (HHW & JTP).

Discussion.—*Rhagovelia rivulosa*, n. sp. is similar to *Rhagovelia tenuipes* Champion but has shorter legs and antennae than the latter, and other differences as follows:

<u>Character</u>	<u>tenuipes</u>	<u>rivulosa</u>
1. Abdominal ventrites VI and VII strongly carinate on midline	yes	no
2. Ratio of mid-femur length/maximum body width	1.74	1.35
3. Ratio of posterior femur length/maximum body width	1.40	0.98
4. Ratio of first antennal segment length/head width	1.34	0.97
5. Shape of right male paramere	Broad, elongate, tapering distally	Broad, ovate

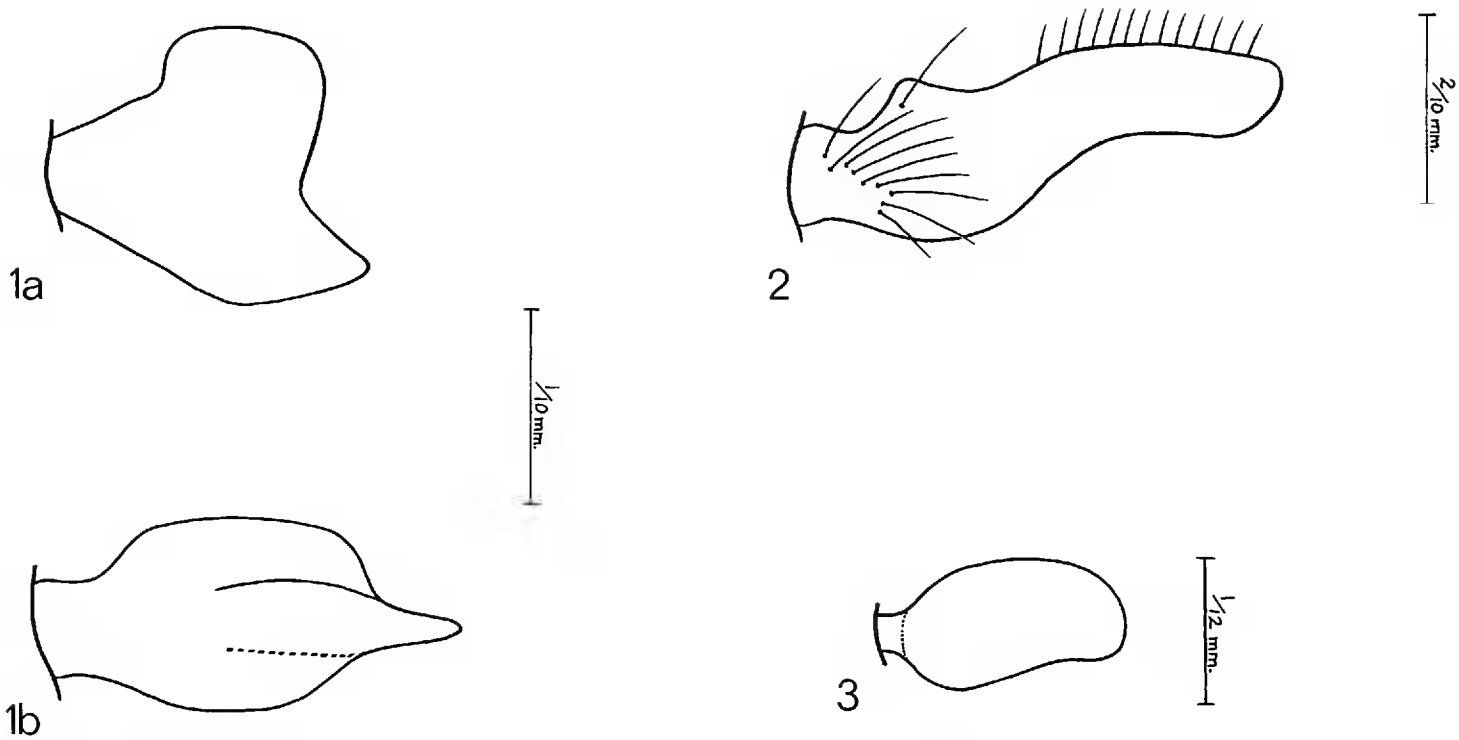
The name *rivulosa* refers to the stream habitat of this insect.

Paravelia truxali, NEW SPECIES

Macropterous male (holotype).—Large, elongate, broadest across humeral angles; coloration orange with dark brown and white markings; length 6.39 mm; maximum width 2.20 mm.

Head orange, eyes silver; deep medial groove present; frons and vertex set with upright black setae, as well as normal three pairs of facial trichobothria; anterior portion of frons appearing pruinose in certain lights, set with tiny black peg-like setae; anterior margins of eyes bordered with black, peg-like setae; a pit present on vertex near inner margin of each eye; vertex with a few black peg-like setae. Antennae brown, clothed with fine golden setae; segment I stoutest, curved; segments III and IV with scattered upright setae equal in length to diameter of segment; proportions of antennal segments I–IV as follows: 62; 52; 52; 59.

Pronotum orange, anterior lobe, humeral angles, and broad stripe medially dark brown; subcarinate medial ridge present; anterior lobe with a row of coarse pits



Figures 1–3. Veliidae, left male parameres, lateral view. 1. *Stridulivelia* species. a. *S. epeixis* Drake and Menke. b. *S. speciosa*, n. sp. 2. *Paravelia truxali*, n. sp. 3. *Rhagovelia rivulosa*, n. sp.

along forward margin, areas surrounding pits and along lateral margin vaguely pruinose; surface set with erect black setae; posterior lobe convex, separated from anterior lobe by a row of coarse pits; humeral angles produced into rounded lobes; posterior apex acute, smoothly margined; surface set with upright black setae, deeply and coarsely pitted, pits becoming more pronounced posteriorly; pleural region with a row of coarse pits running from humeri to margin of fore coxal cavity, area surrounding pits vaguely pruinose, set with fine black setae.

Abdomen orange brown, covered with fine gold setae; wings long, macropterous, dark brown, reaching nearly to tip of genital segments; two (1 + 1) ovate white spots present at basal angles adjoining pronotum; two (1 + 1) elongate pallid areas present adjoining costal margin near middle; an ovate white spot present centrally distad; veins set with fine upright black hairs.

Ventral surface orange, thorax brownish, gula and anterior margin of prosternum set with tiny black peg-like setae; rostrum orange, glabrous, with brown stripe medially, tip black; thoracic tergites set with fine, upright golden to fuscous setae; abdominal segments clothed with fine golden setae; a pair of acute tubercular processes present laterally along ventral margin of ventrite VII. Legs orange brown, femora and tibiae lightly infuscated apically; all segments clothed with fine golden setae; trochanters and fore femora with scattered longer, erect golden setae; fore tibia with raised black microserrate ridge on distal half of inner margin; posterior femora with a row of about 20 black pegs on ventral surface increasing in size distally; proportions of legs as follows:

	<u>Femur</u>	<u>Tibia</u>	<u>Tarsal II</u>	<u>Tarsal III</u>
Anterior	100	100	12	28
Middle	128	124	36	36
Posterior	152	172	32	36

Genital segments clothed with fine golden setae, intermixed with black peg-like setae on dorsal surfaces; suranal plate with blade-like median carina, dorsal margin

set with tiny black peg-like setae; parameres symmetrical, blunt, shape as in Figure 2, set with long golden setae basally, with a row of upright hairs along inner margins.

Macropterous female (allotype).—Generally similar to male in structure and coloration; fore tibia lacking raised ridge on distal half; posterior femora with about seven black pegs on ventral surface, increasing in size distally; length 5.86 mm; maximum width 2.06 mm.

Material examined.—Holotype macropterous ♂ and allotype macropterous ♀: BRAZIL, Goias, 20 km N Sao Joao da Alianca, IV-21-56 (upper Rio Toncantins system), F. S. Truxal (LACM). Paratypes, 1 ♂, 4 ♀ macropterous, same data as types (LACM, JTP).

Discussion.—*Paravelia truxali*, n. sp. most closely resembles *P. platensis* Berg and *P. williamsi* Hungerford, but differs from both of these by the shape and position of the white basal hemelytral spots which are elongate and reach to the base of the hemelytra in the latter two species but are irregular ovate and separated from the base of the hemelytra in *truxali*. In *truxali* the suranal plate has a dorsal median carina lacking in *platensis*; we have no males of *williamsi*, but such a structure is not mentioned or figured by Hungerford (1930). Finally, in *truxali* the pronotum is acuminate posteriorly, a characteristic lacking in any closely related *Paravelia* species; *Paravelia itatiaiana* Drake has a similar pronotal structure but lacks an apical hemelytral white marking.

The name *truxali* honors the contributions of Dr. Fred Truxal to our knowledge of aquatic Hemiptera.

***Rhagovelia traili* (Buchanan-White)**

Rhagovelia traili (Buchanan-White), 1879. J. Linn. Soc., 14:487.

Rhagovelia perfidiosa Bacon, 1956. Univ. Kansas Sci. Bull., 38:798. (New Synonymy)

Fresh material from Manaus matches exactly Bacon's type material of *perfidiosa* which was taken by Olalla in Brazil but without exact locality data. *Rhagovelia traili* White has been an enigma because the taxon was founded on two winged females from Manaus, whereas most *Rhagovelia* species have been described from males. Bacon (1956) listed *traili* as an unknown species. Drake (1958) published a splendid figure of the type of *traili* prepared by Arthur Smith; our comparison of this type with paratypes of *perfidiosa* confirms that the two are indeed synonymous.

Material examined.—BRAZIL: 1 ♀ alate, Manaus, on board at light, August 1875, type of *traili* (BMNH); 2 ♂, 2 ♀ apterous, 1 ♂ alate, A. M. Olalla, No. 379 (no locality or date), paratypes of *perfidiosa* (JTP); (all of the following are apterous specimens from HHW Coll.) 3 ♂, 3 ♀, Manaus, Ig. Castanha, 22-X-65, E. J. Fittkau, A-; 1 ♀, Rio Paru do Oeste, pr. alter Tiriyo-Maloca, 10-I-61, W. Sattler, Sa 891; 1 ♂, 6 ♀, Rio Paru do Oeste, pr. neue Tiriyo-Maloca, 27-I-61, W. Sattler, Sa 853; 3 ♂, 1 ♀, Rio Branco de Obidas, 18-VII-47, H. Sioli, S196; 1 ♂, 1 ♀, Rio Negro, Rio Cuieiras, Lager Tapiri, 22-VII-61, E. J. Fittkau, A214; 1 ♂, 1 ♀, Rio Solimoes, Ilha Jucara, 3-IX-61, E. J. Fittkau, A255; 1 ♂, 1 ♀, Rio Negro, Iharape, 7-X-59, H. Sioli, S317; 1 ♂, 1 ♀, Unter. Rio Negro, Ig. Cachoeira, 25-XI-62, E. J. Fittkau, A420; 1 ♂, 1 ♀, Unter. Rio Negro, Ig. Incarnada, 24-XI-62, E. J. Fittkau, A416;

1 ♂, Sao Paulo de Olivenca, Igarape Anaquete, 24-X-59, H. Sioli, S324; 1 ♂, Umg. Belem do Para, Ig. bei Benfica, 13-XII-60, W. Sattler, Sa 875.

Veloidea reposita (Drake and Harris)

Drake and Lauck (1959) in a review of the genus *Veloidea* stated that *V. reposita* was known only from the type series collected at Chiquimula, Guatemala. In expeditions to Mexico and Mesoamerica we have collected this species over a wide area including the following localities: GUATEMALA: 24 mi E Guatemala City, CL1321, I-12-70. HONDURAS: 10 mi S Choluteca, CL1260, XII-22-69. MEXICO: Chiapas, 7 mi N of Arriaga, CL1246, XII-18-69; W of Rizo de Oro, CL1331, I-14-70. Sinaloa, Panuco, CL1637, IV-21-81.

These insects are found in cool clear mountain streams, usually under overhanging rock ledges just above the water in accompaniment with *Stridulivelia* (*Aenictovelia*) spp. Their habitat during daylight hours indicates that they are negatively phototropic and probably seek their prey at night.

LITERATURE CITED

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 ———, and D. R. Lauck. 1959. The genus *Veloidea* Gould (Hemiptera: Veliidae). Proc. Biol. Soc. Washington, 72:161-166.
 Hungerford, H. B. 1930. Three new *Velia* from South America. J. Kansas Entomol. Soc., 3:23-27.

PUBLICATIONS RECEIVED

Bumble Bees and Cuckoo Bumble Bees of California (Hymenoptera: Apidae). By Robbin W. Thorp, Donald S. Horning, Jr., and Lorry L. Dunning. Bulletin of the California Insect Survey, vol. 23, viii + 79 pp., 168 figs., 27 maps. Issue date on review card given as February 1983. Received by PCES at CAS on 17 May 1983. Published and distributed by University of California Press, 2223 Fulton Street, Berkeley, CA 94720, telephone (415) 642-4562. Price \$19.00 paperbound. ISBN 0-520-09645-2.

This excellent volume is based on the study of 46,000 specimens, of which over 30,000 provided California flight distribution records (Figs. 1-27), and over 7400 provided flower association data. The introduction (pp. 1-12) contains sections on biology and domestication, flower relationships, distribution and abundance, mimicry, and taxonomic methods. The systematics section (pp. 13-53) provides a key to the genera of Bombini, key to subgenera and species of *Bombus* in California with 24 species analyzed, and key to the genus *Psithyrus* with 3 species analyzed. Sections on list of plant genera visited by California Bombini (pp. 55-59), literature cited (pp. 61-63), and Figures 28 to 168 (pp. 67-78) include illustrations on structure, color patterns and variation, colony development, and nest structure, close with an index to Bombini and synonyms (p. 79).—P. H. Arnaud, Jr., California Academy of Sciences, Golden Gate Park, San Francisco, California 94118.